CLAIMS

What is claimed is:

1. An apparatus comprising:

a target area;

a flash lamp to produce light rays; and

a reflecting device having a plurality of reflecting zones each with an associated reflectivity, the reflecting device to receive at least a portion of the light rays and to reflect at least some of the received light rays substantially towards a first side of the target area.

2. The apparatus of claim 1, further comprising

a backside heating device to emit heat towards a second side of the target area.

3. The apparatus of claim 2, wherein the backside heating device comprises at least one of a group consisting of a hotplate, a tungsten lamp, and a halogen lamp.

4. The apparatus of claim 3, wherein the backside heating device further comprises a plurality of heating zones, each heating zone capable of being independently controlled.

5. The apparatus of claim 1, wherein the reflecting device is a plate-type reflector.

6. The apparatus of claim 5, further comprising:

a vertical axis substantially through the center of the apparatus; and

the plurality of reflecting zones being substantially symmetrical around the vertical axis.

7. The apparatus of claim 6, wherein the plurality of reflecting zones are concentric rings.

8. The apparatus of claim 1, wherein each of the plurality of reflecting zones comprises at least one of a group consisting of aluminum, gold, stainless steel, and molybdenum.

9. The apparatus of claim 1, wherein the flash lamp comprises a plasma-type flash lamp.

10. The apparatus of claim 9, wherein the plasma-type flash lamp comprises a Xenon lamp or a Mercury lamp.

11. The apparatus of claim 1, wherein the target area is adapted to receive a substrate.

12. The apparatus of claim 11, wherein the substrate comprises a 300-mm semiconductor wafer.

13. A method for flash lamp processing comprising:

generating light rays from a flash lamp; and

reflecting at least a portion of the light rays with a reflecting device substantially towards a first surface of a substrate, the reflecting device having a plurality of reflecting zones, each reflecting zone having an associated reflectivity.

14. The method for flash lamp processing of claim 13, wherein the reflecting device is a plate-type reflector that is substantially axis-symmetric around a vertical axis.

15. The method for flash lamp processing of claim 13, further comprising:

heating a second surface of the substrate with a backside heating device to a pre-flash temperature prior to generating light rays from the flash lamp.

16. The method for flash lamp processing of claim 15, wherein the backside heating device comprises a plurality of heating zones, and the method further includes

independently controlling the heating zones based at least in part on reflectivity of portions of the substrate.

17. The method for flash lamp processing of claim 15, further comprising:

activating implanted ions in the first surface of the substrate by heating the second surface to a pre-flash temperature approximately at or below an ion diffusion temperature; and

heating the first surface of substrate to a temperature approximately between the ion diffusion temperature and a substrate melting temperature, said heating the first surface done, at least in part, by light rays generated from the flash lamp.

18. The method for flash lamp processing of claim 17, wherein the light rays generated from the flash lamp heat the first surface of the substrate to a temperature just below the substrate melting temperature.

19. The method for flash lamp processing of claim 17, wherein the first surface of the substrate is above the ion diffusion temperature for a time period of approximately three milliseconds or less.

20. A system comprising:

a pre-flash processing device adapted to process a substrate;

a flash lamp reactor including

a target area adapted to receive the substrate such that the first surface of the substrate corresponds with a first side of the target area;

a first flash lamp to produce first light rays; and

a reflecting device having a plurality of reflecting zones each with an associated reflectivity, the reflecting device to receive at least a portion of the first light rays and to reflect at least some of the first light rays substantially towards the first side of the target area; and

a transfer mechanism adapted to transfer the substrate from the pre-flash processing device to the flash lamp reactor.

21. The system of claim 20, wherein the substrate comprises a semiconductor wafer.

22. The system of claim 20, wherein the pre-flash processing device comprises one of a group consisting of an ion implantation device, a metal deposition device, a low-k deposition device, and a high-k deposition device.

23. The system of claim 20, wherein the flash lamp reactor further comprises:
a backside heating device, to emit heat towards a second side of the target area.

24. The system of claim 23, wherein the backside heating device includes a plurality of heating zones, each heating zone capable of being independently controlled.